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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/877,223	06/08/2001	Kazuhiro Honda	116-010872	8537

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David C. Hanson
WEBB ZIESENHEIM LOGSDON ORKIN & HANSON, P.C.
700 Koppers Building
436 Seventh Avenue
Pittsburgh, PA 15219

EXAMINER

TUCKER, WESLEY J

ART UNIT

PAPER NUMBER

2623

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/877,223

Applicant(s)

HONDA, KAZUHIRO

Examiner

Wes Tucker

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☒ Claim(s) 4 and 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☒ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on June 16, 2000. It is noted, however, that applicant has not filed a certified copy of the Japanese Patent Application No. 2000-180851 as required by 35 U.S.C. 119(b).

Claim Objections

1. Claims 4 and 8 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim depends from more than one claim. See MPEP § 608.01(n). Accordingly, the claims 4 and 8 have not been further treated on the merits.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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3. Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 4,769,680 to Resor, III et al.

4. With regard to claim 1, Resor discloses a metrology instrument for measuring and inspecting deviations between a pair of elements of a pattern to be stitched within an image (column 5, lines 10-25).

Resor further discloses a means for obtaining an image pattern for inspection (column 3, lines 39-51 and column 4, lines 1-10), said image pattern having a stitching part at which a pair of elements of said image pattern are stitched to each other along a straight boundary line extending along said stitching part (column 4, lines 17-21). Here Resor discloses a laser interferometer as a means for inspecting the image sections projected onto the substrate and also discloses a pair of cameras used to project the images onto the substrate. The image is stitched or the two images are precisely butted with one another.

Resor further discloses a delta X measuring device for measuring deviation delta X between stitched elements of said image pattern along said straight boundary line (column 5, lines 10-25). Resor discloses an exposure stage movement for compensation in both X and Y directions measured by the laser interferometer for compensating skewed exposure patterns. The patterns are stitched together or precisely butted (column 4, lines 17-21).

Resor further discloses a storing means for storing two sets of data about images indicating dose distributions in memory, said dose distributions

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being calculated by a simulation method under the condition that an energetic beam is used when said elements of said pattern are transferred (column 4, lines 48-55). Here Resor discloses that the exposure intensity or dose distributions are controlled by software and must therefore be stored as a data set. There are two cameras so two sets of data are stored.

Resor further discloses an image superimposing means for shifting one of the images indicating the dose distributions by said delta X along said straight boundary line and by a desired amount delta Y in a direction vertical to said straight boundary line relatively to the other and superimposing both of said images indicating the dose distributions (column 6, lines 2-32). Resor discloses a method wherein the X and Y positions of the patterns imaged on the substrate are used to align and recalibrate the system producing new exposure patterns to be superimposed on the substrate to be stitched together.

Resor further discloses an image comparator for taking the correlation between image data obtained for said inspection and image data produced by the superimposing by comparing these two kinds of image data (column 6, lines 2-32). Resor discloses using the calibration repeatedly by comparing the patterns or correlating the patterns and realigning the system.

5. With regard to claim 2, Resor discloses the metrology instrument of claim 1, wherein there are further provided a decision device for making a decision based on said correlation as to whether said delta Y should be updated and a delta Y-setting device for resetting delta Y if said delta Y is updated, and wherein

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said delta Y is updated until said correlation becomes less than a given value (column 6, lines 2-32). Again from the discussion of claim 1, Resor discloses recalibrating the system in both the X and Y directions repeatedly as needed.

6. With regard to claim 3, Resor discloses the metrology instrument of claim 1, further comprising a delta Y-setting device for updating the value of delta Y a set number of times and a decision device for detecting the value of delta Y that minimizes said correlation (column 6, lines 2-32). The change in the Y dimension is determined by the calibration mechanism and the system is realigned repeatedly so that the optimum change in the Y direction is effectively determined when enough alignments are performed.

7. With regard to claim 4, Resor discloses the metrology instrument wherein image data about dose distributions of plural pattern shapes are stored in memory (column 4, lines 48-53). Here Resor discloses the exposure or dose distribution as being controlled by intensity feedback, which inherently involves a memory for storing the exposure intensities. Further since the intensities are stored for any mask exposure it is understood that plural pattern shapes are stored as well.

8. With regard to claims 5-8 the discussions of claims 1-4 apply respectively. Resor discloses the method as well as the metrology instrument.

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1-8 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,583,854 to Hazama et al.

11. With regard to claim 1, Hazama discloses a metrology instrument for measuring and inspecting deviations between a pair of elements of a pattern to be stitched within an image (column 2, lines 54-59).

Hazama further discloses a means for obtaining an image pattern for inspection, said image pattern having a stitching part at which a pair of elements of said image pattern are stitched to each other along a straight boundary line extending along said stitching part (column 3, lines 3-18).

Hazama further discloses a delta X-measuring device for measuring deviation delta X between stitched elements of said image pattern along said straight boundary line (Fig. 27).

Hazama further discloses a storing means for storing two sets of data about images indicating dose distributions in memory, said dose distributions being calculated by a simulation method under the condition that an energetic beam is used when said elements of said pattern are transferred (column 3, lines 3-18).

Hazama discloses an image superimposing means for shifting one of the images indicating the dose distributions by said δX along said straight boundary line and by a desired amount δY in a direction vertical to said straight boundary line relatively to the other and superimposing both of said images indicating the dose distributions (column 3, lines 3-18 and Fig. 27).

Hazama further discloses an image comparator for taking the correlation between image data obtained for said inspection and image data produced by the superimposing by comparing these two kinds of image data (column 3, lines 3-18).

12. With regard to claim 2, Hazama discloses the metrology instrument of claim 1, wherein there are further provided a decision device for making a decision based on said correlation as to whether said δY should be updated and a δY -setting device for resetting δY if said δY is updated, and wherein said δY is updated until said correlation becomes less than a given value (column 3, lines 3-18 and Fig. 27).

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13. With regard to claim 3, Hazama discloses the metrology instrument of claim 1, further comprising a delta Y-setting device for updating the value of delta Y a set number of times and a decision device for detecting the value of delta Y that minimizes said correlation (column 3, lines 3-18 and Fig. 27).

14. With regard to claim 4, Hazama discloses the metrology instrument wherein image data about dose distributions of plural pattern shapes are stored in memory (column 3, lines 3-18).

15. With regard to claims 5-8 the discussions of claims 1-4 apply respectively. Hazama discloses the method as well as the metrology instrument.

Prior Art

16. Other prior art considered relevant but not relied on is as follows:

U.S. Patent 5,132,195 to Pool

U.S. Patent 6,136,517 to Fletcher

U.S. Patent 4,676,630 to Matsushita et al.

U.S. Patent 5,437,946 to McCoy

U.S. Patent 6,225,013 to Cohen et al.

U.S. Patent 5,696,835 to Hennessey et al.

Conclusion


17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wes Tucker whose telephone number is 703-305-6700. The examiner can normally be reached on 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703)308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wes Tucker

4-14-2004


AMELIA M. AU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600